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# Forest Research Note

**N**ortheastern Forest

FOREST SERVICE, U.S. DEPT. OF AGRICULTURE, 102 MOTORS AVENUE, UPPER DARBY, PA.

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## CONTROL OF RHODODENDRON BY BASAL SPRAY

Rhododendron (*Rhododendron maximum* L.) is a large shrub that presents problems in timber management throughout the Appalachian Mountains. Although sometimes found in single clumps, rhododendron characteristically occurs in extensive dense thickets reaching heights of 10 feet or more (fig. 1). Of major concern to foresters is the difficulty in securing tree regeneration on areas occupied by this shrub. Also, because of its prolific growth, rhododendron undoubtedly competes severely with existing overstory trees for moisture and nutrients. Except where aesthetic values are a consideration, control or eradication is definitely desirable.

The need for control is emphasized by the fact that rhododendron is more abundant and vigorous on the better sites. It flourishes on well-drained acid soils in cool, moist locations on shaded mountainsides and along stream bottoms; it thrives even in the deep shade of closed canopies. It also grows on the tops of high mountains where rainfall is heavy and temperatures are moderately low — even on rocky areas of shallow soil — but is less objectionable in these places because the sites are less productive for timber.

Rhododendron clumps spread vegetatively by layering and by this means coalesce with other clumps to form characteristic thickets. When cut, burned, or otherwise disturbed, rhododendron regenerates vigorously as stump sprouts, root suckers, and sprouts from layered stems.



Figure 1. — The problem: a typical rhododendron thicket.

The species is comparatively resistant to the commonly used chemical herbicides. In 1955, Sluder<sup>1</sup> tested the following treatments on rhododendron in North Carolina: (1) basal application of a 20-pound ahg<sup>2</sup> mixture of 2,4,5-T in oil; (2) stem cutting only; (3) stem cutting with a 20-pound ahg mixture of 2,4,5-T in oil applied to the stumps; and (4) stem cutting with ammate crystals applied to the stumps. Only the third treatment was effective.

The same treatments, except for the ammate application, were tested later on the Fernow Experimental Forest to check their performance in northern West Virginia. The results are reported here.

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<sup>1</sup> Sluder, Earl R. Control of cull trees and weed species in hardwood stands. U. S. Forest Serv. Southeast. Forest Expt. Sta., Sta. Paper 95, 13 pp., 1958.

<sup>2</sup> Acid equivalent per 100 gallons of mixture.

## Methods and Materials

Three treatments and a control were included in the West Virginia study. They were:

The Control, A — no treatment.

Treatment B — stem cutting only.

Treatment C — stem cutting and stump spraying with a 20-pound ahg mixture of 2,4,5-T in diesel oil.

Treatment D — basal spraying with the same mixture as in C above.

The chemicals in Treatments C and D were applied with a hand sprayer.

Ten rhododendron clumps were included in each treatment. The number of stems per clump, counting major stems and sprouts of all sizes, ranged from 1 to 102. Treatments B and C were started in August 1959; treatment D was done in April 1960, before the start of the growing season.

## Results and Discussion

Results were analyzed 2 years after treatment (table 1). Two methods proved highly successful in controlling rhododendron: cutting followed by stump spraying, and basal spraying without cutting.

Treatment C, stem cutting and stump spraying, is probably 100 percent effective when applied thoroughly. Although 19 new sprouts appeared after this treatment in 2 of the 10 clumps, these originated probably from stumps that were missed or only partly covered in spraying. The kills after spraying were mostly quick and unmistakable — rot and bark

Table 1. — Effect of eradication treatments on rhododendron in West Virginia after 2 years

Treatment*	Live stems		Increase	Decrease
	Before treatment	Two years after treatment		
	<i>No.</i>	<i>No.</i>	<i>Percent</i>	<i>Percent</i>
A	250	308	23	—
B	497	1,107	123	—
C	242	19	—	92
D	273	12	—	96

\*A = control, no treatment; B = stems cut, no further treatment; C = stems cut and stumps sprayed with 2,4,5-T; D = stems basally sprayed with 2,4,5-T.

slippage became visible within a few weeks. This and the general absence of sprouts indicated good chemical penetration and root kill (fig. 2).

Treatment D, the basal application, was ultimately as effective as treatment C. However, treatment D killed relatively slowly. Often only the lower branches were affected the first year, which gave the appearance of a browse line. The full effect of the treatment became evident only after the second growing season (fig. 3).

Our good results with basal spray in West Virginia were somewhat surprising in view of Sluder's poor kills with this treatment in the Southeast. These different responses to the same treatment in the two regions are inexplicable. Any of several things could be involved, including genetic differences within the species, or climatic variables.

The sprouting ability of rhododendron was revealed in treatment B, cutting with no chemical application (fig. 4). This test, and other past experience, showed that cutting without additional treatment provides



Figure 2. — Rhododendron stems cut and stumps sprayed.  
(Treatment C.)



Figure 3. — Basal spraying killed this rhododendron clump.  
(Treatment D.)





Figure 4. — A year after cutting this rhododendron clump had sprouted vigorously. (Treatment B.)



Figure 5. — Six years after cutting this clump of rhododendron was more extensive and vigorous than the original clump, although not as tall.

only temporary control. A few years after cutting treatment new sprouts will present an even greater problem than existed before. Figure 5 illustrates the regrowth from one clump 6 years after cutting.

Although treatment costs could not be determined in a small study like this, basal spraying obviously proved a cheaper and easier method than cutting and stump spraying. To obtain some measure of the cost of basal spraying, a 1/10-acre area of rhododendron thicket was recently treated and cost records were kept. This representative plot contained more than 12,300 rhododendron stems per acre of all sizes.

The spray material used was the same as that used in treatment D — a 20-pound ahg mixture of 2,4,5-T in diesel oil. Application was by hand sprayer. Costs of the treatment were computed only for application time, chemical, and carrier. On a per-acre basis, these costs came to \$137.16. This figure included:

Labor—30 man-hours at \$1.25/hr.	= \$37.50
Spray material—120 gallons, including:	
6 gallons 2,4,5-T at \$13.00/gal.	= 78.00
114 gallons diesel oil at \$0.19/gal.	= 21.66
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Total	\$137.16

Because of the small size of the test area, the cost figures are not wholly reliable. But even at half the above amount the costs would be exorbitant. Basal spraying therefore offers little promise as a practical treatment to reduce heavy cover of rhododendron. However, it may be a feasible method of eliminating scattered clumps that are just getting a toe hold in the woods.

— HARRY W. YAWNEY

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